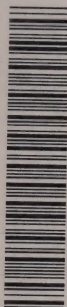


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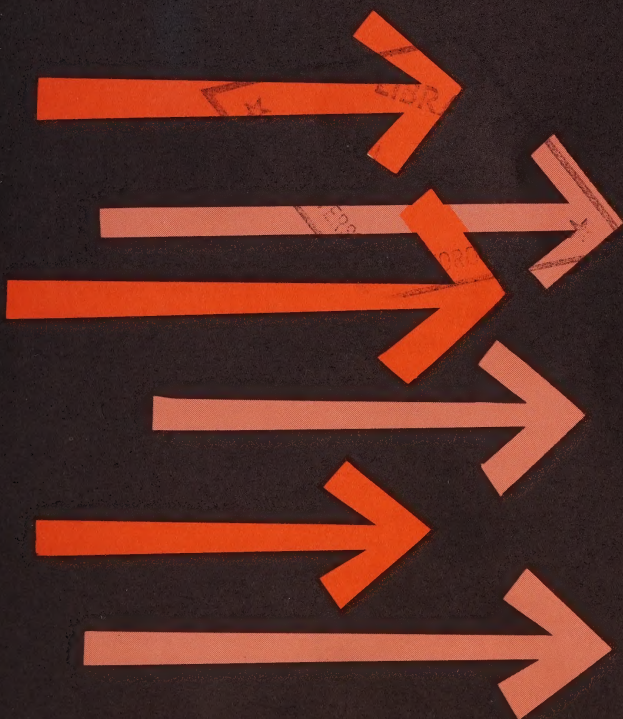
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our guide to electric home heating

Government
Publication

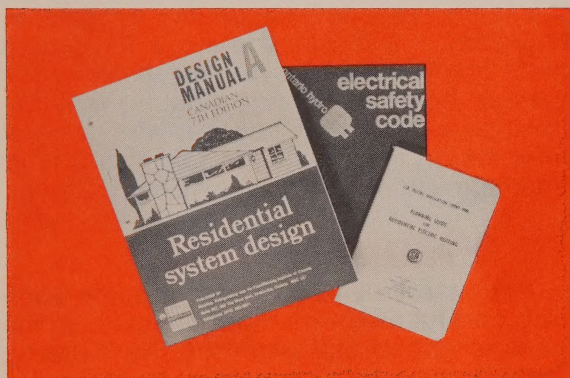




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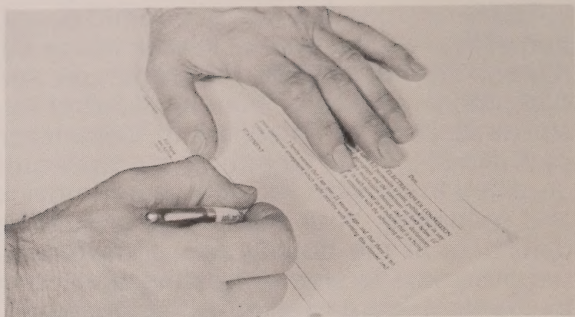
The future comfort and economic operation of the heating system in your home will depend on your selection of a reputable and competent contractor. Your local Better Business Bureau or Chamber of Commerce can assist you in selecting a contractor qualified to provide you with expert advice and guidance. Your contractor should be familiar with the quality and performance requirements for electric heating developed by the electrical and allied industries as well as the requirements of provincial and local authorities including:

- (a) Canadian Standards Association # C273-1 Performance Standard For Residential Electric Heating.
- (b) Provincial building code requirements and municipal regulations.
- (c) Heating, Refrigerating and Air Conditioning Institute-Central System Design Requirements for warm air systems.
- (d) Ontario Electrical Safety Code.



These requirements have been developed to ensure that your heating installations are correctly designed to provide comfort, proper performance and the efficient use of electrical energy. Installations which do not meet these requirements will result in unsatisfactory operation, waste of valuable energy and high heating costs.

When buying or building a new home, you should insist that these requirements, where applicable are written into your purchase offer or construction contract. If you are planning modifications to your existing heating system or an addition to your home (with electric heating) it is your responsi-



bility to ensure that your contractor is familiar with these codes and requirements and that they are included in your construction or installation contract. If these requirements are not met at the time of installation any necessary modifications or upgrading after the installation is completed could be both inconvenient and costly.

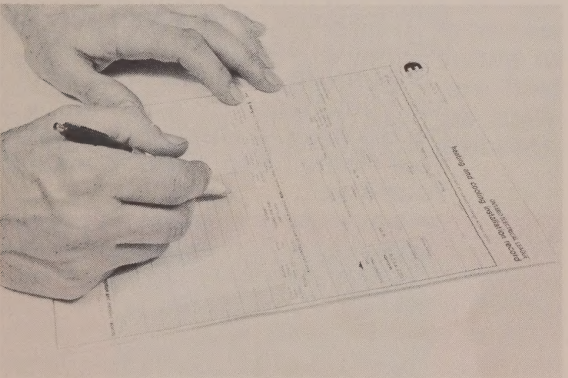
It is not the purpose of this booklet to provide you with complete details on the design of electric heating systems since this is the responsibility of your contractor. However, it outlines the more important facts which will assist you in assessing the various types of electric heating installations as well as providing you with general information as a basis for discussing your heating requirements with your contractor.

THE IMPORTANCE OF PROPER DESIGN

To conserve energy and to provide comfort, careful attention must be given to the design and installation of the heating system, including insulation. Heat should not be allowed to escape outdoors. Escaping heat represents wasted energy and increased heating costs. Insulation must be installed to meet the specific requirements as outlined in the above publications, codes and regulations. Storm windows and doors, are required to conserve energy and ensure comfort. The heating installation must be properly sized for the space to be heated. Improper sizing could result in discomfort as well as higher equipment and heating costs. Adequate planning and proper design of electric heating installations will ensure comfort with maximum economy of installation and operation.



When examining plans for a new home, house renovation, addition or modification to your existing heating system it is your responsibility to ensure that your contractor carries out the following.



- (a) That he checks the home for loose fitting doors, windows, and other openings. To reduce these sources of heat loss your home will need tight fitting storm doors and windows properly caulked and weatherstripped.
- (b) That insulation is installed in all ceilings, walls and floors exposed to outdoor temperatures to form a barrier against excessive heat loss. Insulation must be installed on basement walls or walls in heated crawl spaces to at least two feet below ground level, on walls next to garages and floors of rooms over attached garages. Insulation must also be installed around the edges of concrete floors which are

laid at ground level. The amount of insulation required for these areas should be based on the latest industry requirements and codes mentioned previously.

Insulation when properly applied will have three immediate beneficial effects.

1. It will reduce the size or capacity of the heating system needed to do the job, thereby lowering the cost of the heating installation.
2. It will save energy and reduce heating costs that will continue over the life of the home, thereby offsetting the additional cost of the added insulation.
3. The comfort level of the home will be greatly increased by eliminating drafts and cold areas.

Make sure that insulation is properly installed with adequate attic ventilation and vapour barriers.

For more detailed information ask your Hydro for a free copy of the Booklets—"Guide to Insulating Your Home", and "How to Insulate Your Attic".



- (c) That your contractor calculates the amount of heat needed based on the difference between the indoor temperature and the outdoor temperature using weather charts for determining the "design" temperature for your location. Since any alterations in your house design could affect the amount of heat required you should bring any such changes to the attention of your builder or contractor (usually the heating contractor). Modifications in the design of your heating system can

then be made if necessary.

When calculations are completed your contractor will advise you of the proper amount of heat you'll need. Again we stress the importance of pre-planning and proper design of the heating installation to ensure satisfactory performance, comfort and the most efficient use of electrical energy.

HEATING SYSTEMS

Electric heat is available in a variety of forms; individual room heating (unitary systems), hot water systems and electric furnaces (central systems).

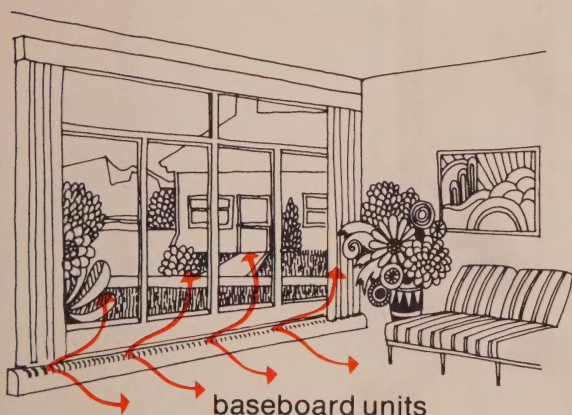
—each designed and manufactured to meet certain needs or construction methods.

Thus you and your contractor have flexibility in deciding which system will best suit your requirements. With the types as illustrated, some are readily adaptable to new construction, others are more suited to building additions, while others are best used in particular rooms such as bathrooms, kitchens, vestibules and basements.

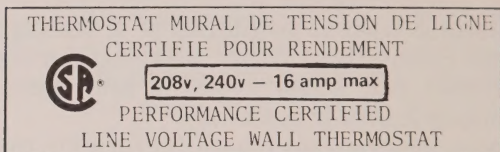
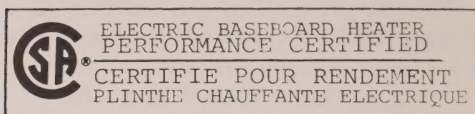
1. ROOM-BY-ROOM HEATING (UNITARY SYSTEMS)

Heaters and thermostats are installed in each room or area throughout the house, which allows the heating system to be controlled on a room-by-room basis.

These heaters include—baseboard units, wall mounted convection heaters, floor

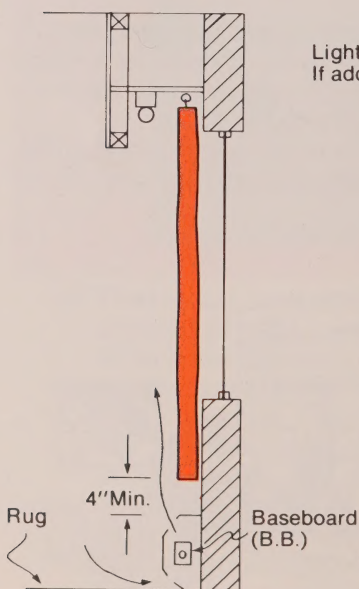


inserts, and ceiling heating cable. Sketch shows a typical baseboard installation. Heat from the unit flows upwards and into the room. Baseboard heaters should be installed on outside walls and under windows where possible.

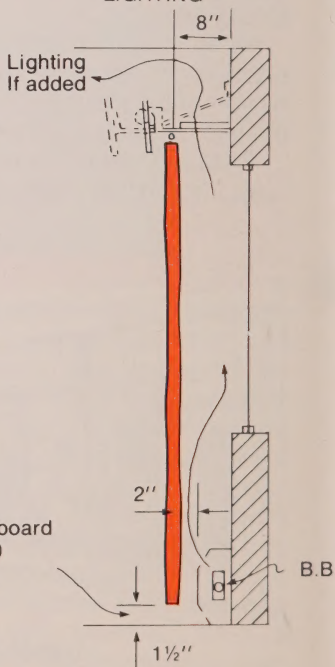


Baseboard heaters and thermostats which are *performance* certified by the Canadian Standards Association should always be used. *Note:* If floor length drapes are to be used, special attention to adequate clearance is necessary. See sketch.

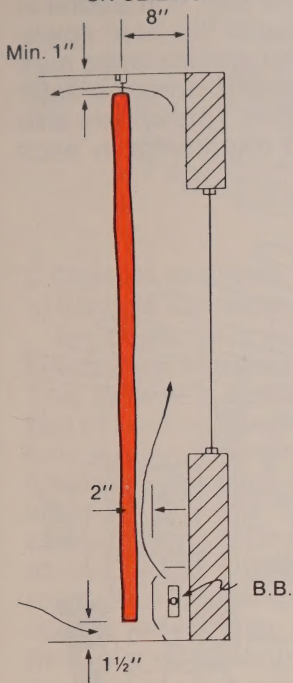
(a) CLOSED VALANCE WITH LIGHTING



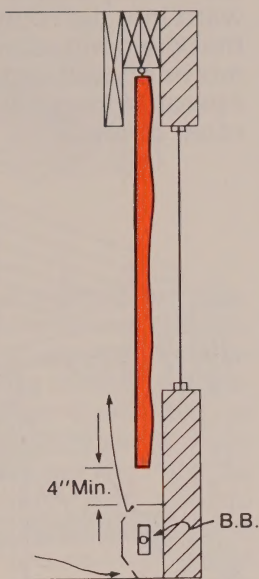
(b) OPEN VALANCE WITH OR WITHOUT LIGHTING



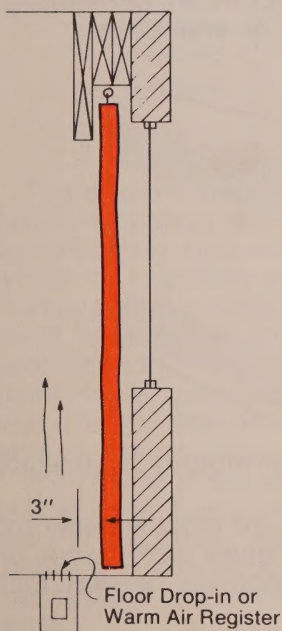
(c) TRACK
ON CEILING



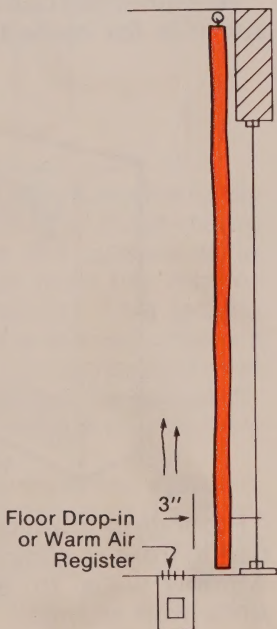
(d) CLOSED VALANCE
DRAPES CLOSE
TO WALL



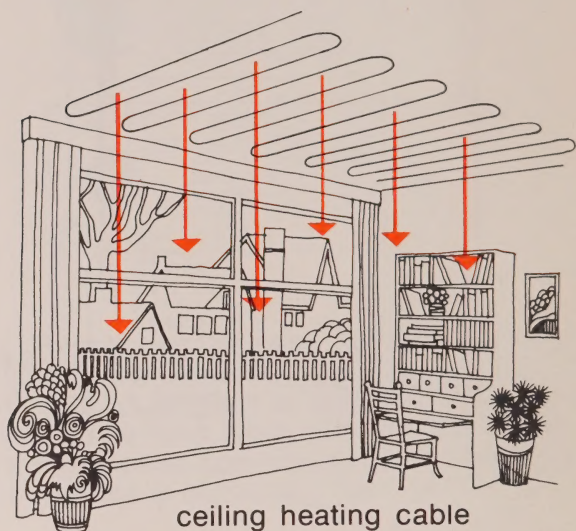
(e) FLOOR LENGTH
DRAPES HUNG
CLOSE TO WALL



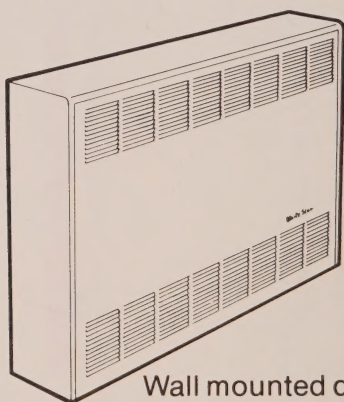
(f) GLASS DOOR
OR FLOOR
LENGTH PANEL



Sketch shows ceiling heating cable. In this application, heating wire, embedded in the ceiling plaster radiates the heat downward into the room. You should make sure that the contractor uses the proper plaster mix or drywall application. This system also operates from its own thermostat in each room or area.

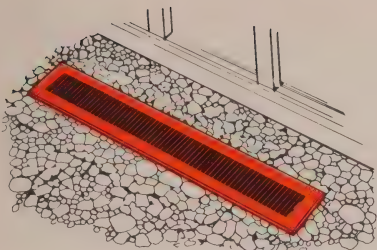


Wall mounted convectors are particularly suitable for hallway or stairwells.



Floor drop-in units, are most suitable for use in front of sliding glass patio doors, or window walls to effectively blanket that area with warm air.

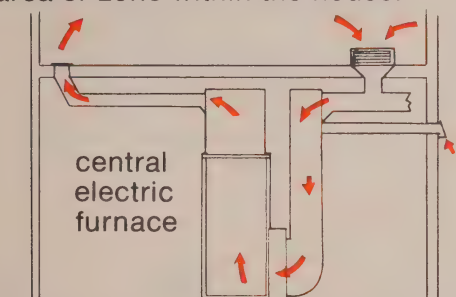
Floor
drop-in
unit



2. CENTRAL SYSTEMS

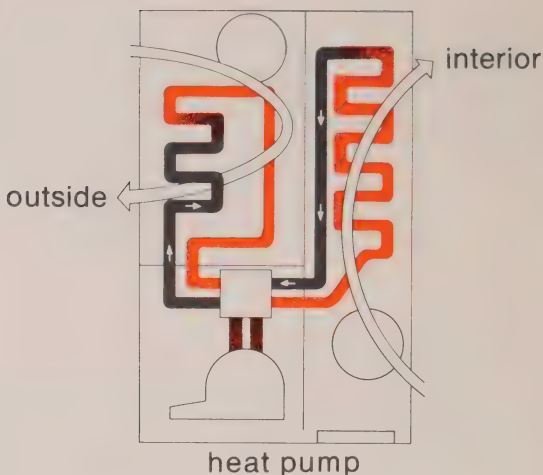
a) Electric Furnaces

Air, heated in a central electric furnace, is distributed throughout the house in ducts. This system is suitable where the installation of cooling, air cleaning and humidification equipment may be an immediate or future requirement. Limitations in the existing duct systems of older homes must be considered when converting to central electric warm air heating. While complete room-by-room temperature control is not usually provided by a central system, it can be designed to control the heat in a particular area or zone within the house.



The electric heat pump, automatically provides heating or cooling of the dwelling by extracting heat from the outside air in winter or expelling heat from the interior during summer (see sketch). This system must be installed to the manufacturer's specifications through his authorized heat pump dealer to ensure proper performance. You should insist on a service contract for annual maintenance.

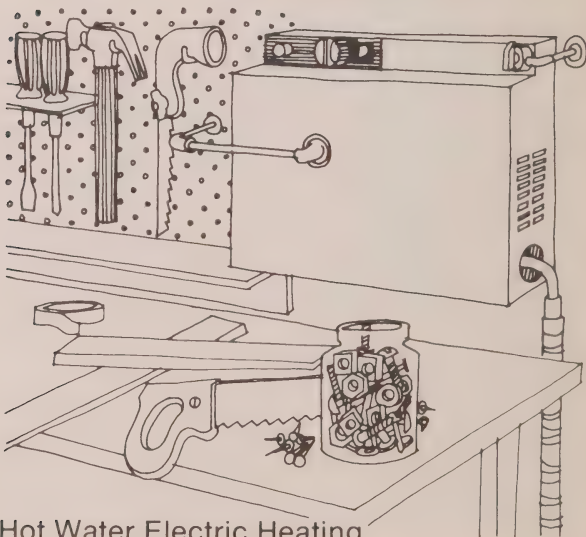
With either of the above central systems, proper design and installation of the duct-work is *absolutely essential*. As previously mentioned the warm air heating industry has established standards for proper duct-work.



b) Hot Water Electric Heating Systems

Water, heated in an electric boiler, is circulated through pipes into radiators or baseboard convectors in each room. This type of heating system is basically simple and may adapt well to renovating an existing hot water system. Some modifications will have to be made, but most of the existing piping can be used as part of the new installation. Sketch shows the relative size of the boiler.

These brief descriptions will help you become familiar with the range of electric heating equipment available. Your contractor will help you decide on the final installation.

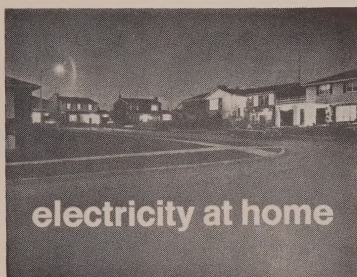


Hot Water Electric Heating

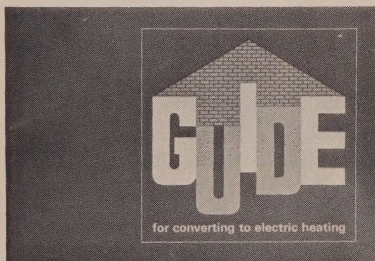
RENOVATIONS AND CONVERSIONS

Where piping or ductwork exists, central electric hot water or warm air heating systems are possible replacements provided your heating contractor determines whether the existing piping or duct sizing is adequate, or can be easily modified. When the existing piping or ductwork is not adequate, the heating system can be replaced by a room-by-room system. (Usually baseboard.)

In the majority of cases, upgrading of the electrical wiring system will be needed (upgrading which may already be planned for the renovated house). Make sure your contractor is aware of this and for further information, ask your Hydro for the free booklet, "Electricity at Home."



In older homes the ceiling is usually accessible through an attic hatch and insulation should be upgraded to the standards recommended for electric heating. Unfinished basements and crawl spaces should also be insulated. Solid masonry walls are particularly difficult to insulate. Consult an experienced insulating contractor. Ask for the booklet "Guide for Converting to Electric Heating."



When adding a room, insulation should be applied according to the standards. A

room-by-room system may be installed without extending present ductwork or burdening an existing central system.

ELECTRIC HEATING CHECK LIST *

You should use the following check list during all stages of construction to ensure that none of these important requirements have been overlooked. You are responsible to have any deficiencies rectified before your contractor leaves the job.

- ☐ Walls—above grade -R12 Insulation
- ☐ Walls—Heated basements and crawl spaces to 2 feet below grade -R8 Insulation
- ☐ Ceilings—exposed to outdoor temperatures -R28 Insulation
- ☐ Floors—over ventilated crawl spaces, garages and other exposed areas -R20 Insulation
- ☐ Floors—between levels of multi-level homes using cable heat -R8 Insulation
- ☐ Concrete slabs on grade and walk-out basements -R8 Insulation
(with cable heat) -R10 Insulation
- ☐ Windows—double glazed or stormed
- ☐ Outside Doors—stormed and caulked
- ☐ Fireplaces—tight fitting damper
- ☐ Vapour Barriers—over all insulation on warm side (next to living area)
- ☐ Attic Ventilation—roof slope over 2 in 12—1 sq. ft. of free ventilation area per 300 sq. ft. of ceiling.
—roof slope less than 2 in 12—1 sq. ft. of free ventilation area per 150 sq. ft. of ceiling.
- ☐ Heating equipment—CSA *performance* certified baseboards.
- ☐ Thermostats (line voltage 240 volts.)
—CSA *performance* certified
- ☐ Exhaust Fans (kitchen & bathrooms)
—CSA *performance* certified

*In conversion jobs it may not be possible to meet all the check list requirements. Your contractor can advise what is practical.

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